RECLAMATION
Managing Water in the West

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Corrosion Webinar Series

Intro to Hazardous Materials

What are Hazardous Materials?

- General term which covers many regulated materials such as:
  - Hazardous Waste
  - Asbestos
  - PCBs
  - Equipment containing elemental Mercury
  - Used Oil
  - May include other items depending upon State Regulations such as electronics and concrete aggregate.

BOR and Hazardous Materials

"Reclamation's facility managers shall consider hazardous waste handling before the initial purchase of hazardous materials, hazardous substances, oils, or as early as possible in the design of processes which use hazardous materials or have the potential to generate hazardous wastes. It is Reclamation policy to carefully consider such purchases or designs with the intention of substituting nonhazardous materials or of making process changes where possible to avoid or reduce the generation of hazardous wastes. Whenever the generation of hazardous waste is unavoidable, Reclamation will ensure effective management is employed to minimize potential releases to the environment and any long-term liability."

- Reclamation Manual ENV P15 Section 5A

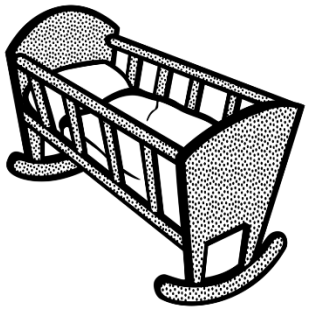
BOR and Hazardous Materials

Why it's important to know what you've got…

- EPA Regulations are "cradle to grave"
- Executive Order 12088
- Save your schedule and budget!

Cradle to Grave

EPA Solid Waste Regulations for Generators are from:

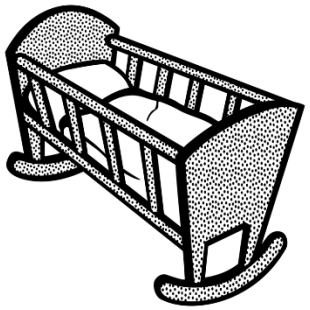


TO

- Disposal responsibility cannot be delegated… meaning since it was generated on a Reclamation site, Reclamation will own the responsibility for disposing of the waste properly in perpetuity (read: forever). This is why we want the records of testing, transportation, and disposal. We want to ensure the waste is being correctly classified and disposed of.
- Contractors who create waste become “co-generators” with Reclamation meaning they share the responsibility.

Cradle to Grave cont.

EPA Solid Waste Regulations for Generators are from:



TO

- Although contractors are co-generators, Reclamation holds the ultimate responsibility financially and legally.

- Examples:
  - Superfund sites
  - Leadville Mine Drainage project

Executive Order 12088

All Government Agencies shall follow State Environmental Regulations!

- **State Regulations:**
  - **Tend to be more strict.**
  - **May cover more than Federal (EPA) regulations**
    - **Examples:**
      - **Colorado and Electronic Waste**
      - **Washington and California vs PCBs**
        - **Federal standard stops at 50 parts per million (ppm)**
        - **Washington and California regulate PCBs in oil down to 2 ppm and 5 ppm, respectively**

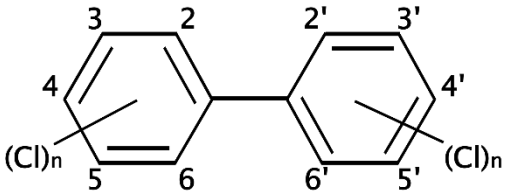
Save $$ and save your schedule!

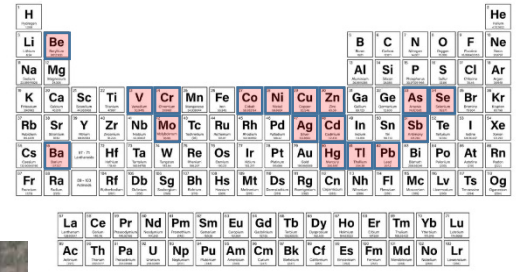
- **If you know what you have and the quantity, BOR cost estimates will reflect this→ you can budget your project more efficiently.**

- **Contractors will be able to bid the work more accurately.**
  - **Prevents costly change orders and construction delays down the road**
  - **Note: some electrical and mechanical contractors do not want to work with hazardous materials.**
  - **If this does happen, good to know ahead of time so can split out contracts or use IDIQ option, if available.**

Common Hazardous Materials at BOR sites?

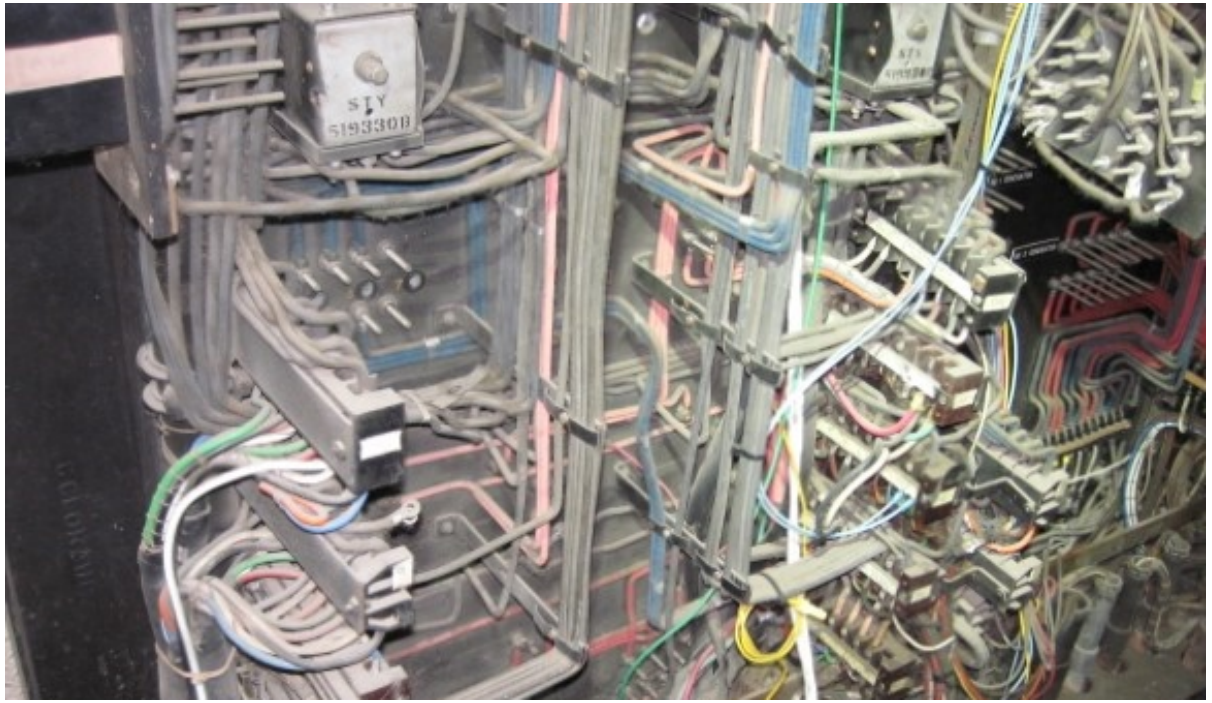
- Asbestos
- PCBs – PolyChlorinated Biphenyls
- Regulated Metals (aka RCRA 8 or CAM17)
- Coal Tar aka Polycyclic Aromatic Hydrocarbons (PAHs)
- Electronics (printed circuit boards, etc.)
- Used oil





Where can you find: Asbestos?

- Electrical wire insulation



- Insulator boards

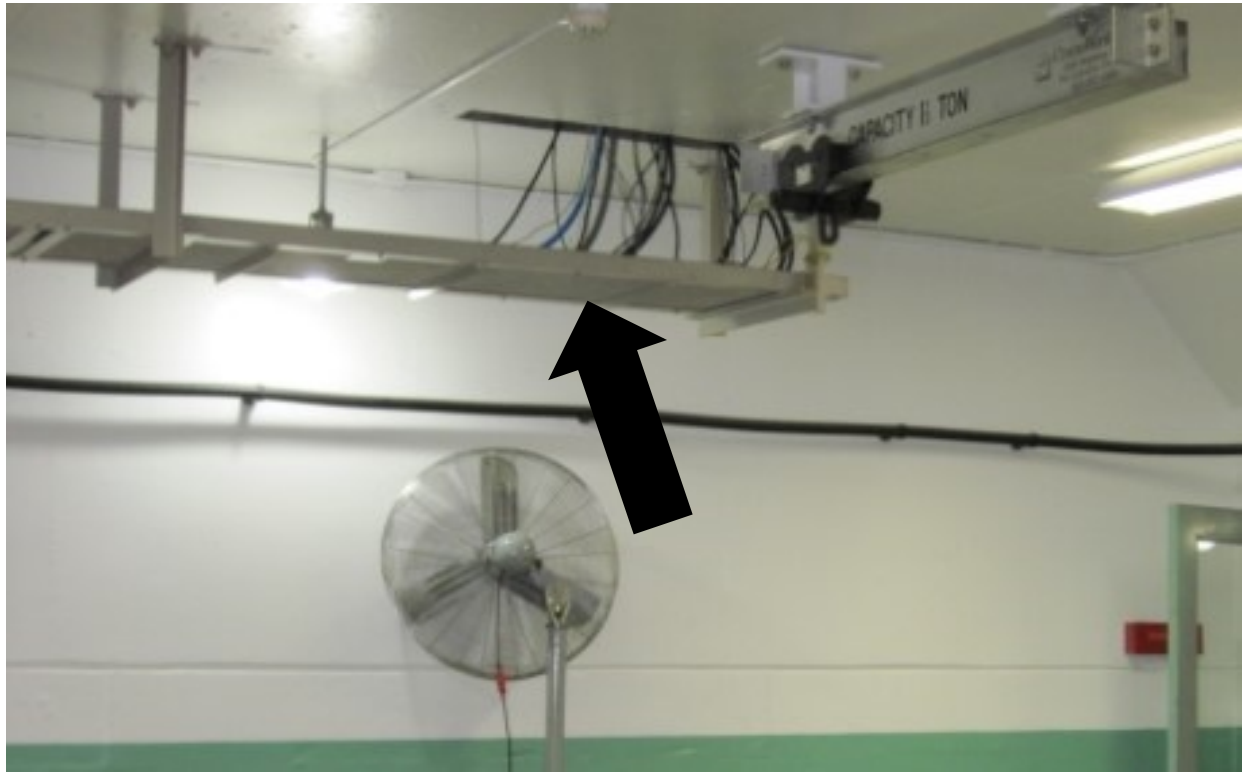
Where can you find: Asbestos?

- **Electrical putty**

- **Some coatings**

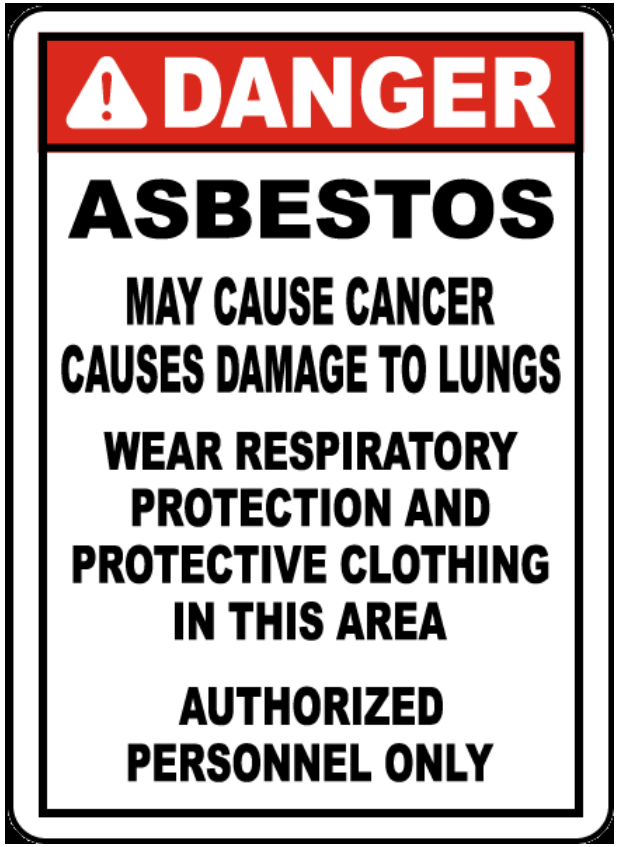
Where can you find: Asbestos, cont.?

- Transite (electrical conduit and trays)



Where can you find: Asbestos, cont.?

- Valve stem packing
- Mechanical control joints
- Concrete (asbestos is a naturally mineral so may show up in concrete aggregate and is directly regulated in some states e.g. California. Just because it is not specifically named, does not mean it's not regulated. It's still not allowed to be released into the air which may occur when handling.

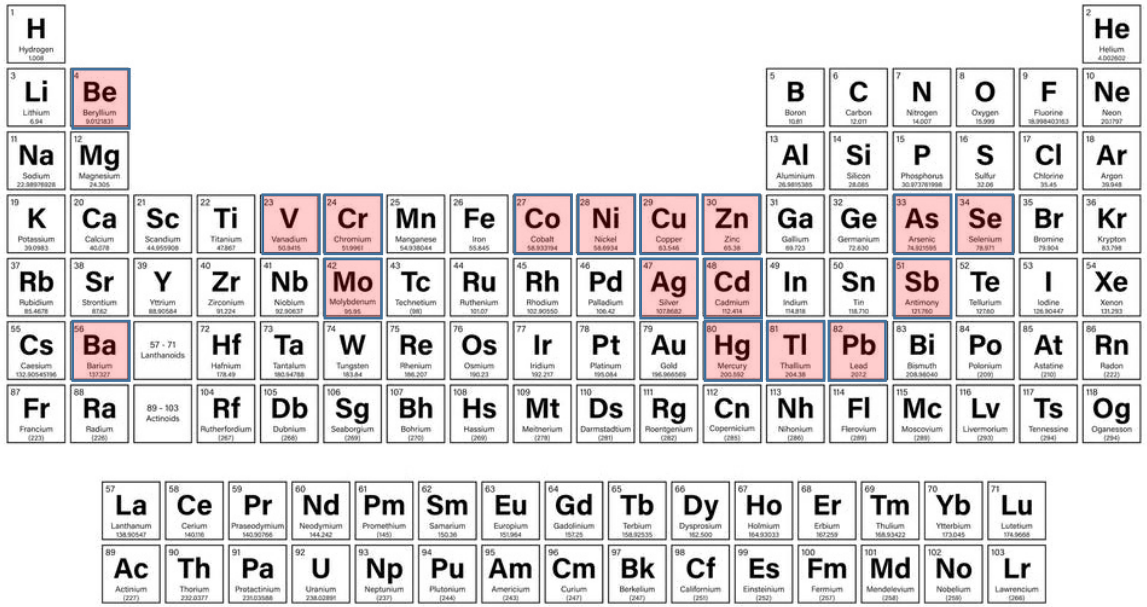


Where can you find: PCBs?

- Typically found in transformer oil but…
  - Has been found in hydraulic oil and electrical breaker oil.
  - Usually caused by cross contamination in the past.
- Coatings
  - Vinyl Resins, Lead Primers, Aluminum Topcoats, Coal Tar Enamel

Where can you find: Regulated Metals?

- Coatings (integral part of coatings)
- Used / contaminated oil



CAM17 Metals:

(California Administrative Manual)

- Antimony (Sb)
- Arsenic (As)
- Barium (Ba)
- Beryllium (Be)
- Cadmium (Cd)
- Chromium (Cr)
- Cobalt (Co)
- Copper (Cu)
- Lead (Pb)
- Mercury (Hg)
- Molybdenum (Mo)
- Nickel (Ni)
- Selenium (Se)
- Silver (Ag)
- Thallium (Tl)
- Vanadium (V)
- Zinc (Zn)

RCRA 8 Metals:

(Resource Recovery and Conservation Act)

- Arsenic (As)
- Barium (Ba)
- Cadmium (Cd)
- Chromium (Cr)
- Lead (Pb)
- Mercury (Hg)
- Selenium (Se)
- Silver (Ag)

Where can you find: Coal Tar?

- **Protective coatings matrix material, usually penstock / pipeline interior and sometimes exterior.**
  - **Coal tar enamel (through 1980s), coal tar epoxy (1980s-2000s)**
  - **Black in color, smells like asphalt which it's related to.**
  - **Tends to be fairly thick (several millimeters).**
- **Coal Tar may also contain asbestos.**
  - **Asbestos may have been used as a stiffener.**

What do you do if you have Hazardous Materials?

- FER: Screen possible waste materials
- Design: use screening results to estimate costs for removal
- Spec: include Haz Mat section that lets contractor know how to proceed
  - Containment/collection of waste
  - Testing plan
  - Waste disposal plan- send to licensed facilities
- Construction:
  - Submittal review- ensure contractor is following spec
  - Ensure Reclamation has appropriate documentation for all hazmat
- Record Keeping: in perpetuity

How can TSC-MCL help: Training & Certs

- **TSC Hazardous Materials personnel have specialized training and certifications:**
  - **Asbestos Building Inspector, federal and state (CO, UT, MT).**
  - **HECP including HECP for Grand Coulee.**
  - **Confined Space.**
  - **Fall Protection.**
  - **BOR Underwater Inspections (diving).**
  - **Certified Hazardous Materials Manager.**
  - **Professional Engineer.**

How can TSC-MCL help on a project?

FER process

- Review project scope with Team Lead & Client to develop Hazardous Materials Survey Scope based upon project requirements and state / federal regulations.

Schedule site visit

- Work with Client and Team Lead to schedule site visit during an existing outage as much as possible. We try to fit to YOUR schedule.

Perform Survey

- Perform Hazardous Materials Survey. Personnel are experienced in knowing what to look for, how to collect samples.

How can TSC-MCL help on a project, cont.?

HM Survey Report

- Summarizes laboratory analytical results as well as field findings (items not sampled but suspect, items noted as known HM). Photo-documentation of project features, samples, suspect items, etc. Information stored on SharePoint site for easy access.

Incorporate into Design

- Research into State and federal requirements to ensure submittals meet regulations. Ensure BOR gets a good accounting of waste generated and disposed of / recycled.

Construction

- Provide expert reviews of HM submittals to ensure submittals meet regulatory requirements.
- Can also provide on-site assistance / consultation for previously unknown, suspect hazardous materials

Case Study: Fish Facility Recoating Project

Scoping/TBE

- Recoating of gates, trashracks, fish screen
- Refurbishing hydraulic controls

Sample Collection:

- Arrange during project outage
- Coating samples from Gates based on color/age/historical data
- Hydraulic oil
- Electrical components: wire insulation, putty, insulator boards

Analysis & Reporting

- Regulated metals
- Asbestos (bulk by PLM)
- GROs (gasoline range organics)
- PCBs
- Compile, Analyze, Discuss with team/facility manager

Interface with Design Team

- Quantity estimate worksheets
- Specification sections based upon analytical results and stat/fed regulations

Construction

- Submittal reviews and approvals

Case Study: Forebay Dredging Project

Scoping/TBE

- Removal of sediment buildup in forebay area

Sample Collection:

- Arrange during low flow period
- Facilitate and support permitting
- Use drill rig with hollow stem auger to collect sample cores
- Compile composite samples from cores

Analysis & Reporting

- EPA priority pollutant list
- Regional freshwater dredge management framework
- Known contaminants
- Known land-use: indicates contaminants or lack thereof
- Compile, Analyze, Discuss with team/facility manager

Interface with Design Team

- Quantity estimate worksheets
- Specification sections based upon analytical results and stat/fed regulations

Construction

- Submittal reviews and approvals

Introduction to Hazardous Materials Review

- Knowing what you have and how much…
  - Can save your budget and construction schedule.
- BOR owns waste generation responsibility forever.
- Common materials at BOR sites:
  - Asbestos
  - PCBs
  - Regulated Metals
  - Coal Tar
  - Used Oil
  - Elemental Mercury

Resources

- **TSC – Materials and Corrosion Laboratory Staff**
  - **Lise Pederson and Kevin Kelly**
  - **For Reclamation staff: Hazardous Materials Survey SharePoint: https://projectsdrosp.bor.doi.net/tscecm/SitePages/Home.aspx**
- **Regional Hazardous Materials Coordinator**
- **Reclamation Manual ENV P15**
  - **https://www.usbr.gov/recman/env/env-p15.pdf**

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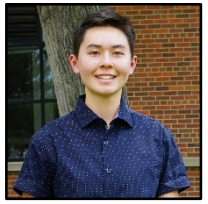

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